



Job Number: SVGJ-141167
 Company: PDC
 Lease/Well: PJ 1
 Location: Weld County, CO
 Rig Name: MS Energy Wireline
 RKB: 0'
 G.L. or M.S.L.: GL

State/Country: Colorado/USA
 Declination: 8.32°
 Grid: East To True North
 File name: S:\2014SU-1\PDC\GJ\PJ\1.SVY
 Date/Time: 18-Sep-14 / 15:19
 Curve Name: Surface - 6400' M.D. (Rate Gyro)

MS SURVEY

WINSERVE SURVEY CALCULATIONS
 Minimum Curvature Method
 Vertical Section Plane .00
 Vertical Section Referenced to Wellhead
 Rectangular Coordinates Referenced to Wellhead

| <i>Measured Depth FT</i> | <i>Incl Angle Deg</i> | <i>Drift Direction Deg</i> | <i>True Vertical Depth</i> | <i>N-S FT</i> | <i>E-W FT</i> | <i>Vertical Section FT</i> | <i>C L O S U R E</i> | | <i>Dogleg Severity Deg/100</i> |
|----------------------------------|-------------------------------|------------------------------------|------------------------------------|-------------------|-------------------|------------------------------------|------------------------|--------------------------|--|
| | | | | | | | <i>Distance FT</i> | <i>Direction Deg</i> | |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 100.00 | .32 | 261.45 | 100.00 | -.04 | -.28 | -.04 | .28 | 261.45 | .32 |
| 200.00 | .44 | 194.06 | 200.00 | -.46 | -.65 | -.46 | .79 | 234.79 | .43 |
| 300.00 | .27 | 24.32 | 300.00 | -.61 | -.64 | -.61 | .89 | 226.30 | .71 |
| 400.00 | .32 | 129.23 | 400.00 | -.58 | -.33 | -.58 | .66 | 209.73 | .47 |
| 500.00 | .16 | 238.91 | 500.00 | -.82 | -.23 | -.82 | .86 | 195.71 | .40 |
| 600.00 | .28 | 12.42 | 600.00 | -.66 | -.30 | -.66 | .72 | 204.44 | .41 |
| 700.00 | .52 | 105.97 | 699.99 | -.54 | .19 | -.54 | .58 | 160.72 | .61 |
| 800.00 | .43 | 147.06 | 799.99 | -.98 | .83 | -.98 | 1.29 | 139.82 | .34 |
| 900.00 | .35 | 157.52 | 899.99 | -1.58 | 1.15 | -1.58 | 1.96 | 143.93 | .11 |

| Measured Depth FT | Incl Angle Deg | Drift Direction Deg | True Vertical Depth | N-S FT | E-W FT | Vertical Section FT | C L O S U R E | | Dogleg Severity Deg/100 |
|-------------------------|----------------------|---------------------------|---------------------------|-----------|-----------|---------------------------|----------------|------------------|-------------------------------|
| | | | | | | | Distance FT | Direction Deg | |
| 1000.00 | .03 | 91.10 | 999.99 | -1.86 | 1.29 | -1.86 | 2.27 | 145.22 | .34 |
| 1100.00 | .54 | 95.87 | 1099.99 | -1.91 | 1.79 | -1.91 | 2.62 | 136.90 | .51 |
| 1200.00 | .53 | 145.03 | 1199.98 | -2.34 | 2.52 | -2.34 | 3.44 | 132.83 | .45 |
| 1300.00 | .51 | 147.56 | 1299.98 | -3.09 | 3.03 | -3.09 | 4.33 | 135.63 | .03 |
| 1400.00 | .46 | 161.04 | 1399.97 | -3.85 | 3.40 | -3.85 | 5.13 | 138.58 | .12 |
| 1500.00 | .48 | 220.53 | 1499.97 | -4.55 | 3.25 | -4.55 | 5.59 | 144.41 | .47 |
| 1600.00 | .45 | 170.28 | 1599.97 | -5.25 | 3.05 | -5.25 | 6.07 | 149.87 | .40 |
| 1700.00 | .46 | 238.34 | 1699.97 | -5.85 | 2.77 | -5.85 | 6.47 | 154.64 | .51 |
| 1800.00 | .28 | 271.72 | 1799.96 | -6.05 | 2.19 | -6.05 | 6.44 | 160.14 | .27 |
| 1900.00 | .40 | 62.69 | 1899.96 | -5.89 | 2.25 | -5.89 | 6.30 | 159.06 | .66 |
| 2000.00 | .55 | 30.11 | 1999.96 | -5.31 | 2.80 | -5.31 | 6.01 | 152.17 | .30 |
| 2100.00 | 1.31 | 25.16 | 2099.95 | -3.86 | 3.53 | -3.86 | 5.23 | 137.56 | .76 |
| 2200.00 | 1.65 | 28.31 | 2199.91 | -1.56 | 4.70 | -1.56 | 4.95 | 108.35 | .35 |
| 2300.00 | 1.46 | 30.53 | 2299.88 | .81 | 6.03 | .81 | 6.08 | 82.38 | .20 |
| 2400.00 | .62 | 27.39 | 2399.86 | 2.38 | 6.93 | 2.38 | 7.32 | 71.00 | .84 |
| 2500.00 | .64 | 8.36 | 2499.85 | 3.42 | 7.26 | 3.42 | 8.02 | 64.78 | .21 |
| 2600.00 | .87 | 322.24 | 2599.84 | 4.57 | 6.87 | 4.57 | 8.25 | 56.38 | .63 |
| 2700.00 | 1.07 | 353.50 | 2699.83 | 6.10 | 6.30 | 6.10 | 8.77 | 45.94 | .56 |
| 2800.00 | 1.26 | 1.72 | 2799.81 | 8.12 | 6.23 | 8.12 | 10.24 | 37.48 | .25 |
| 2900.00 | 1.60 | 4.67 | 2899.78 | 10.61 | 6.38 | 10.61 | 12.38 | 30.99 | .35 |
| 3000.00 | 1.56 | 22.57 | 2999.74 | 13.26 | 7.01 | 13.26 | 15.00 | 27.86 | .49 |
| 3100.00 | 1.21 | 30.30 | 3099.71 | 15.43 | 8.07 | 15.43 | 17.41 | 27.60 | .40 |
| 3200.00 | .40 | 117.74 | 3199.70 | 16.18 | 8.91 | 16.18 | 18.47 | 28.83 | 1.26 |
| 3300.00 | 1.44 | 197.31 | 3299.69 | 14.82 | 8.84 | 14.82 | 17.26 | 30.83 | 1.42 |
| 3400.00 | 1.68 | 195.00 | 3399.65 | 12.20 | 8.09 | 12.20 | 14.64 | 33.54 | .25 |
| 3500.00 | 2.35 | 202.79 | 3499.59 | 8.90 | 6.92 | 8.90 | 11.27 | 37.86 | .72 |
| 3600.00 | 2.00 | 209.58 | 3599.52 | 5.49 | 5.26 | 5.49 | 7.60 | 43.78 | .43 |
| 3700.00 | 2.17 | 212.43 | 3699.45 | 2.37 | 3.38 | 2.37 | 4.13 | 54.95 | .20 |
| 3800.00 | 2.15 | 203.11 | 3799.38 | -.95 | 1.63 | -.95 | 1.89 | 120.18 | .35 |

| Measured Depth FT | Incl Angle Deg | Drift Direction Deg | True Vertical Depth | N-S FT | E-W FT | Vertical Section FT | C L O S U R E | | Dogleg Severity Deg/100 |
|-----------------------------------|----------------------|---------------------------|---------------------------|-----------|-----------|---------------------------|----------------|------------------|-------------------------------|
| | | | | | | | Distance FT | Direction Deg | |
| 3900.00 | 2.78 | 203.51 | 3899.29 | -4.90 | -.07 | -4.90 | 4.90 | 180.83 | .63 |
| 4000.00 | 3.09 | 216.12 | 3999.16 | -9.30 | -2.63 | -9.30 | 9.66 | 195.78 | .71 |
| 4100.00 | 3.25 | 219.64 | 4099.01 | -13.66 | -6.02 | -13.66 | 14.93 | 203.80 | .25 |
| 4200.00 | 2.57 | 228.81 | 4198.88 | -17.32 | -9.52 | -17.32 | 19.76 | 208.80 | .82 |
| 4300.00 | 2.14 | 229.76 | 4298.79 | -20.00 | -12.63 | -20.00 | 23.66 | 212.28 | .43 |
| 4400.00 | 2.12 | 223.24 | 4398.72 | -22.56 | -15.32 | -22.56 | 27.27 | 214.19 | .24 |
| 4500.00 | 1.73 | 232.77 | 4498.67 | -24.82 | -17.79 | -24.82 | 30.54 | 215.64 | .50 |
| 4600.00 | 1.30 | 241.17 | 4598.63 | -26.28 | -19.99 | -26.28 | 33.02 | 217.26 | .48 |
| 4700.00 | .98 | 236.37 | 4698.61 | -27.30 | -21.70 | -27.30 | 34.87 | 218.48 | .33 |
| 4800.00 | .46 | 298.63 | 4798.61 | -27.58 | -22.76 | -27.58 | 35.76 | 219.53 | .87 |
| 4900.00 | .26 | 293.55 | 4898.60 | -27.29 | -23.32 | -27.29 | 35.90 | 220.51 | .20 |
| 5000.00 | .53 | 244.18 | 4998.60 | -27.41 | -23.94 | -27.41 | 36.39 | 221.14 | .41 |
| 5100.00 | 1.00 | 313.25 | 5098.59 | -27.01 | -25.00 | -27.01 | 36.80 | 222.78 | .95 |
| 5200.00 | 1.25 | 12.93 | 5198.58 | -25.35 | -25.39 | -25.35 | 35.88 | 225.04 | 1.14 |
| 5300.00 | 1.38 | 26.24 | 5298.55 | -23.21 | -24.61 | -23.21 | 33.83 | 226.68 | .33 |
| 5400.00 | 1.54 | 42.89 | 5398.52 | -21.14 | -23.16 | -21.14 | 31.36 | 227.62 | .45 |
| 5500.00 | 1.95 | 36.68 | 5498.47 | -18.79 | -21.23 | -18.79 | 28.35 | 228.49 | .45 |
| 5600.00 | 1.86 | 65.81 | 5598.42 | -16.76 | -18.74 | -16.76 | 25.14 | 228.18 | .96 |
| 5700.00 | 2.14 | 87.12 | 5698.36 | -16.00 | -15.39 | -16.00 | 22.20 | 223.88 | .79 |
| 5800.00 | 2.67 | 118.72 | 5798.28 | -17.03 | -11.48 | -17.03 | 20.54 | 214.00 | 1.41 |
| 5900.00 | 2.53 | 148.41 | 5898.18 | -20.03 | -8.29 | -20.03 | 21.67 | 202.47 | 1.34 |
| 6000.00 | 2.05 | 178.98 | 5998.10 | -23.70 | -7.10 | -23.70 | 24.74 | 196.67 | 1.29 |
| 6100.00 | 2.00 | 206.09 | 6098.04 | -27.05 | -7.83 | -27.05 | 28.16 | 196.15 | .95 |
| 6200.00 | 1.48 | 230.49 | 6198.00 | -29.44 | -9.60 | -29.44 | 30.97 | 198.05 | .89 |
| 6300.00 | 1.24 | 244.85 | 6297.97 | -30.72 | -11.57 | -30.72 | 32.83 | 200.64 | .42 |
| Last Survey Depth Recorded | | | | | | | | | |
| 6400.00 | 1.89 | 264.58 | 6397.93 | -31.34 | -14.19 | -31.34 | 34.40 | 204.37 | .84 |